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ANALYSIS OF THE FACTORS PREDICTING CURRICULUM LITERACY OF PRESERVICE TEACHERS[2]

Abstract: This study aimed to explore the factors predicting curriculum literacy of preservice teachers in terms of some variables, such as gender, taking Curriculum Development in Education course, department, and critical thinking disposition. The research used a relational-correlational survey research design. The participants of the research were 336 seniors who were studying in various departments of the Education Faculty at Usak University. The research data were collected via the "Curriculum Literacy Perception Scale" and the "Critical Thinking Disposition Scale". The data were analyzed through descriptive statistics (mean, standard deviation), Pearson correlation analysis and Hierarchical Multiple Regression. The research findings indicated that a medium level correlation was identified between curriculum literacy and critical thinking. It was also revealed that gender, taking Curriculum Development in Education course and department comprising the first model were significant predictors of curriculum literacy and explained 8% of curriculum literacy. As for the critical thinking sub-dimensions comprising the second model, except tenacity-patience and open-mindedness sub-dimensions, metacognition, flexibility and systematicity were significant predictors of curriculum literacy and explained 25% of curriculum literacy. Based on the findings, the Curriculum Development in Education course may be suggested to be offered as a mandatory course for all departments of education faculty. It is also suggested that education faculty focus on enhancing the critical thinking of preservice teachers.

Keywords: curriculum literacy, critical thinking, curriculum development in education course, preservice teachers.

1. Introduction

Teacher effectiveness has always been at the top of the education policy agenda of many countries, since teaching is considered as one of the most important factors in student achievement (Organization for Economic Cooperation and Development [OECD], 2011). Training qualified teachers in Turkey has also maintained its importance due to the fact that increasing the quality of the education system depends on providing qualified teacher input into the system. Thus, various arrangements have been made to enhance teacher qualifications from the past to present. In this sense, teacher training curricula have been updated several times in order to enhance teacher qualifications. Also, General Competencies for the Teaching Profession were determined and updated in 2017 by the Ministry of National

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Education (MoNE) so that teacher training institutions could develop their curricula according to these competencies (MoNE, 2017).

One of the General Competencies for the Teaching Profession is curriculum and content knowledge. Curriculum can be defined broadly as "dealing with learners' experiences, and anything planned in or outside the school is part of the curriculum" (Ornstein & Hunkins, 2014, p. 8). Curriculum includes aims, content, the learning-teaching process and assessment-evaluation dimensions. Preservice teachers are equipped with knowledge and skills in three basic areas: subject content, pedagogical content, and general culture knowledge. Shawer (2010) states that subject and pedagogical content knowledge have limited use and teachers cannot teach effectively without possessing good curricular content knowledge, since teaching competency demands improvement in subject, pedagogical and curricular areas. According to Shawer (2009, cited in Shawer, 2010, p. 202), course design forms a basic part of teachers' curriculum knowledge, being engaged with needs analysis, writing precise aims and objectives, selecting and organizing curriculum content, and evaluating both students and curriculum. The Curriculum Development in Education course that is offered for this purpose helps pre-service teachers to develop positive perceptions towards teaching curricula (Sahan & Duran, 2016). Despite its significance, this course was offered only in two programs in the previous Turkish teacher training curriculum conducted until 2018 (Council of Higher Education, 2007) and offered as an elective course in the updated teacher training curriculum (Council of Higher Education, 2018). However, teachers need to acquire curriculum knowledge and curriculum literacy in their preservice education (Aslan, 2019), since teachers, as the implementers of the curriculum, should carry out the formal curricula in their classrooms accurately. In this sense, in order to actualize curriculum requirements, teachers need to have curriculum literacy.

Curriculum literacy has been defined in different ways by different scholars. Bolat (2017) states that curriculum literacy is having knowledge of the dimensions of a curriculum. Nsibande and Modiba (2012) view curriculum literacy as teachers' capacity to adapt the curriculum to new situations. According to Keskin (2020), curriculum literacy is teachers' awareness of the features specific to educational curricula, their ability to use this awareness in practice, and their use of the curriculum as a guide by critically evaluating and interpreting them. On the other hand, Kahramanoglu (2019) defines curriculum literacy as the process of teachers' interpretation and analysis of a formal curriculum with high-level mental skills, since teachers are the primary factor for the curriculum to be reflected on the learning and teaching process. In addition, Akyildiz (2020) refers to curriculum literacy as a competency area of comprehending all procedures and actions in the process of understanding, implementing and evaluating an educational curriculum. Akyildiz (2020) also adds that curriculum literacy includes the skills of having curriculum knowledge, understanding the curriculum correctly, designing implementation processes and evaluating the learning-teaching process. Therefore, as also expressed by Bolat (2017), teachers need to have knowledge of the dimensions of a curriculum in order for them to develop curriculum literacy. Keskin (2020) emphasizes that the aim of curriculum literacy is to enhance the comprehensibility and practicality of curricula, which have different educational philosophies, aims, content, learning and teaching processes, and assessment and evaluation methods, by teachers. What directly impacts on the success of a curriculum is the implementation of the different dimensions of the curriculum correctly and sufficiently by the teacher. Pinar et al. (1995) assert that curriculum expertise or literacy is required for the effective implementation of any curriculum. Pinar et al. add that curriculum literacy enables teachers to generate interpretations and views so that they can base a plan of action on these.

Depending on the definitions and aims of curriculum literacy, it is of utmost importance for teachers to comprehend and implement the teaching curriculum correctly to realize the curricular aims. It is thought that preservice teachers' higher order thinking skills, especially critical thinking, may be a powerful tool in predicting their curriculum literacy, because critical thinking is a way of careful thinking that may lead teachers to consider the curricula more carefully. Dewey (1910, p. 6), who calls critical thinking reflective thinking more commonly, defines critical thinking as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends". On the other hand, Facione (1990, p. 3) defines it as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference".

In our age, it is necessary to gain new skills, which are called 21st century skills, in order to keep up with the rapidly changing global world (Organization for Economic Cooperation and Development [OECD], 2019). As a 21st century skill, critical thinking is considered as the most important skill for students to develop in the contemporary world (Marin & Halpern, 2011). Departing from its importance, it is necessary to examine what critical thinking consists of in terms of skills, and to elaborate on how to equip students with critical thinking. Unlu (2018) states by considering different definitions of critical thinking, that it consists of some skills, attitudes, and tendencies, leading to the view that critical thinking can be taught. Cheung et al. (2002) reviewed literature about critical thinking and identified the most common skills in these definitions as interpretation, analysis, evaluation of arguments, inference, explanation, and deduction. Also, some dispositions were identified by Hitchcock (2020) as necessary to think critically: (1) attentiveness, (2) habit of inquiry, (3) self-confidence, (4) courage, (5) open-mindedness, (6) willingness, (7) trust in reason, and (8) seeking the truth. Semerci (2016) determined the dispositions of critical thinking as metacognition, flexibility, systematicity, tenacity-patience, and open-mindedness, and added that critical thinking needs to be systematic, far away from prejudices.

Relevant literature points out the crucial role of teachers in equipping students with critical thinking skills (Pithers & Soden, 2000). However, discussions still continue about how critical thinking can be better developed through education (Abrami et al., 2008). Alkin-Sahin and Gozutok (2013) assert that as long as teachers do not display critical thinking behaviours themselves in class, then it is hard to train critical thinking students and bring about transformation in teaching programs. Therefore, it is of great importance for teacher training institutions and programs to create a classroom environment supporting the critical thinking process of preservice teachers, since teachers educated in such an environment may be better at teaching this skill (Unlu, 2018).

As it is seen, the most common skills and dispositions regarding critical thinking may be associated with teachers' curriculum literacy, because, as also stated by Kahramanoglu (2019), curriculum literacy requires high-level mental skills from teachers for their interpretation and analysis of a curriculum. Thus, it is seen as necessary to investigate if an association exists between critical thinking disposition and curriculum literacy.

In addition to critical thinking, gender may predict pre-service teachers' curriculum literacy. Relevant literature indicates female preservice teachers have higher curriculum literacy than males (Erdem & Egmir, 2018; Sarigoz & Bolat, 2018). In addition to gender, department and taking the Curriculum Development in Education course may be effective in predicting pre-service teachers' curriculum literacy. Despite its significance, the Curriculum Development in Education course was only offered in two programs in the former teacher training curriculum

namely the Psychological Counselling and Guidance department and the Social Sciences Teaching department (Council of Higher Education, 2007). However, in studies conducted by Cetinkaya & Tabak (2019) and Tan-Sisman (2021), it was indicated that preservice teachers studying Primary School Teaching Education were found to have higher curriculum literacy and curriculum development knowledge. Hence, it is considered important to investigate if department and taking the Curriculum Development in Education course have an influence on the curriculum literacy of preservice teachers.

Based upon the analysis of the relevant literature, an increasing number of recent studies have been found addressing curriculum literacy (Aslan, 2019; Aslan & Gurlen, 2019; Beck, 2013; Cetinkaya & Tabak, 2019; Demir et al., 2020; Erdem & Egmir, 2018; Karseth & Sivesind, 2010; Kahramanoglu, 2019; Keskin, 2020; Nsibande & Modiba, 2012; Sarigoz & Bolat, 2018; Shawer, 2010; Sural & Dedebali, 2018; Yildiz, 2019). Many of these studies focused on preservice teachers' curriculum literacy. For instance, Aslan (2019) investigated preservice teachers' curriculum literacy with regard to some variables. As a result, it was revealed that they had a high level of curriculum literacy and that no significant differences were found in terms of gender and department. However, those who took the Curriculum Development course had significantly higher curriculum literacy in the reading dimension. Cetinkaya and Tabak (2019) revealed that preservice teachers had a sufficient level of curriculum literacy. Furthermore, preservice teachers studying in the Classroom Teaching department had significantly higher curriculum literacy than those studying in the Pre-School Teaching and Elementary Mathematics Teaching departments. Demir et al. (2020) found that preservice teachers had average level of curriculum literacy. In the study implemented by Erdem and Egmir (2018), preservice teachers had a good level of curriculum literacy. In addition, female preservice teachers and education faculty students with respect to pedagogical formation students had higher curriculum literacy in the writing dimension of curriculum literacy. In another study done by Sarigoz & Bolat (2018), it was indicated that preservice teachers had high and very high curriculum literacy. Also, female preservice teachers had higher curriculum literacy in writing dimension of curriculum literacy; however, no significant differences were found in terms of department. Shawer (2010) sought to determine the impact of self-regulation of learning on preservice teachers' curriculum knowledge and course design skills. As a result of the study, no significant differences were found between low, average and high self-regulated learners in their curriculum knowledge. Unlike the other studies, Sural and Dedebali (2018) investigated if any relationship existed between information literacy and curriculum literacy of preservice teachers. As a result, they found a positive and low and medium-level relationship between curriculum literacy and information literacy sub-dimensions. Also, it was concluded that four sub-dimensions of information literacy together explained 34% of the curriculum literacy of preservice teachers. Yildiz (2019) investigated the relationship between curriculum literacy and cognitive awareness of preservice teachers regarding curriculum development, and found a high and positive relationship.

Despite previous research mostly focused on the level of curriculum literacy in terms of some variables, no study has examined the possible factors that could influence the curriculum literacy of preservice teachers. Nor did a study investigate the correlation between curriculum literacy and critical thinking disposition. Departing from this need, this study seeks to explore correlation between curriculum literacy and critical thinking disposition as well as the factors predicting curriculum literacy of preservice teachers in terms of some variables, such as gender, taking the Curriculum Development in Education course, department, and critical thinking disposition. This study hopes to contribute to the literature to fill in this gap. The findings may also help teacher training institutions to reorganize their curriculum development courses, and some remedies may be sought in teacher training institutions to

equip preservice teachers with curriculum literacy skills. Depending on the main aim of the research, the following research questions were posed:

1. What is the curriculum literacy and critical thinking disposition level of preservice teachers?
2. Is there any relationship between curriculum literacy and the critical thinking disposition of preservice teachers?
3. How well does preservice teachers' gender, taking the Curriculum Development in Education course and department predict curriculum literacy?
4. After controlling for gender, taking the Curriculum Development in Education course and department, how well does critical thinking disposition predict curriculum literacy?

2. Method

2.1. Research Design

The research used a relational survey research design, which is one of the general survey research designs in quantitative research methods. General survey designs provide a quantitative or numeric description of trends, attitudes, or opinions of a population by analyzing a sample of that population (Creswell, 2009). Relational survey research designs determine the existence of change between two or more variables. In relational survey research designs, whether variables change together is investigated, and if there is a change, it is tried to determine how it happened (Karasar, 2011). In this study, the relationship between curriculum literacy and critical thinking disposition as well as the factors predicting curriculum literacy of preservice teachers were investigated.

2.2. Participants

This study was conducted with 336 senior preservice teachers chosen according to purposive sampling. The preservice teachers were studying in different departments of the education faculty at Usak University. The demographic properties of participants can be seen in Table 1:

Table 1. *The demographic properties of participants*

Variables		N	%
Gender	Female	184	54.80
	Male	152	45.20
Taking Curriculum Development in Education course	Yes	167	49.70
	No	169	50.30
Department	Social Studies Teaching	46	13.60
	Elementary Mathematics Teaching	56	16.70
	Primary School Teaching	59	17.60
	Pre-School Teaching	55	16.40
	Turkish Language Teaching	58	17.30
	Guidance and Psychological Counselling	62	18.40
	Total	336	100

In addition, the senior preservice teachers were being trained in the previous teacher training curricula when the data were collected (Council of Higher Education, 2007).

2.3. Data Collection

The data were collected in the spring semester of the 2020-2021 academic year through two measurement tools. Both scales were administered to students online due to the pandemic. Ethical permission was obtained from the Usak University Ethics Committee (Decision #2021-143).

Curriculum Literacy Perception Scale

Curriculum Literacy Perception Scale developed by Keskin (2020) was used to find out preservice teachers' perceptions regarding their curriculum literacy. It is a five point Likert type scale from 'never agree' to 'completely agree'. The scale consisted of 38 items and four sub-factors, which were 'Recognizing the curriculum' with 14 items, 'Implementing the curriculum' with 13 items, 'Querying the curriculum' with 6 items and 'Valuing the curriculum' with 5 items. The Cronbach's Alpha internal consistency coefficient of the whole scale was .93 and .89, .88 and .74 and .64 consecutively. Internal reliability was checked again in the present study and found .89 for the whole scale and .87, .86, .76 and .72 consecutively for the sub-factors.

The Critical Thinking Disposition Scale

The Critical Thinking Disposition scale developed by Semerci (2016) was used to assess preservice teachers' critical thinking disposition. It is a five-point Likert type scale from 'never agree' to 'completely agree. The scale included 49 items and five sub-factors, which were 'Metacognition' with 14 items, 'Flexibility' with 11 items, 'Systematicity' with 13 items, 'Tenacity-Patience' with 8 items, and 'Open-mindedness' with 3 items. The coefficient of Cronbach Alpha was found to be 0.96 for the whole scale and .90, .89, .90, .83 and .67 consecutively for the sub-factors. Internal reliability was checked again in the present study and found to be .93 for the whole scale and .91, .90, .87, .81 and .69 consecutively for the sub-factors.

2.4. Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS. 23). Descriptive statistics were conducted to run for mean and standard deviation. Pearson correlation analysis was also utilized to find out if there was a correlation between preservice teachers' curriculum literacy and critical thinking disposition. If the correlation coefficient was between 0.70-1.00, it indicated high correlation; if it was between 0.70- 0.30, it showed medium level correlation; and if it was between 0.30-0.00, it displayed low level correlation (Buyukozturk, 2007).

Furthermore, the Hierarchical Multiple Linear Regression (HMLR) was employed, and in the regression model, the outcome variable was curriculum literacy and the predictor variables were gender, taking Curriculum Development in Education course, department, and critical thinking disposition. If the outcome variable was predicted by predictor variables was explored in this study (Tabachnick & Fidell, 2014). For that purpose, two models were set by considering the related literature. In the first model, gender, taking the Curriculum Development in Education course and department were included. In the second model, the critical thinking disposition was included.

Before starting the analysis, assumptions of normality, linearity, homoscedasticity, multicollinearity, and the influential observations were checked to make sure that none of them were violated (Field, 2009). Then, all categorical variables, which were gender and department, were dummy coded to be continuous variables. The gender variable was dummy coded as 'male& female' by selecting 'female' as reference, since relevant literature indicated female preservice teachers had higher curriculum literacy than males (Erdem & Egmir, 2018; Sarigoz & Bolat, 2018). In addition to gender, department variable was dummy coded into five new variables, which were 'social vs primary', 'mathematics vs primary', 'preschool vs primary', 'Turkish vs primary' and 'guidance vs primary' by selecting the 'Primary School Teaching' department as reference, since based on the analysis of the relevant literature, preservice teachers studying Primary School Teaching Education were found to have higher curriculum literacy and curriculum development knowledge (Cetinkaya & Tabak, 2019; Tan-Sisman, 2021).

3. Findings

Findings are presented in line with the research questions. Findings in relation to the curriculum literacy and critical thinking disposition level of preservice teachers are presented in Table 2.

Table 2. *Descriptive values for curriculum literacy and critical thinking disposition*

	M	**SD**
Recognizing the curriculum	3.68	.79
Implementing the curriculum	3.59	.85
Querying the curriculum	3.38	.92
Valuing the curriculum	3.92	.76
Total curriculum literacy	3.64	.83
Metacognition	3.79	.89
Flexibility	4.02	.93
Systematicity	3.82	.74
Tenacity-patience	3.98	.84
Open-mindedness	3.99	.78
Total critical thinking	3.92	.84

As a result of the descriptive analysis shown in Table 2, it was revealed that preservice teachers' total mean scores regarding curriculum literacy were lower than their total scores for critical thinking disposition. In relation to curriculum literacy, preservice teachers had high mean scores in recognizing, implementing, and valuing the curriculum. However, they had a medium mean score for querying the curriculum dimension. In addition, it is seen from Table 2 that preservice teachers had high mean scores in all dimensions of critical thinking disposition. Correlations between preservice teachers' curriculum literacy and critical thinking disposition were shown in Table 3.

Table 3. *Correlations between curriculum literacy and critical thinking disposition*

	Curriculum literacy	Recognizing	Implementing	Querying	Valuing	Critical thinking	Metacognition	Flexibility	Systematicity	Tenacity-patience	Open-mindedness
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	1.00										
(2)	.90**	1.00									
(3)	.72**	.53**	1.00								
(4)	.84**	.51**	.48**	1.00							
(5)	.76**	.67**	.58**	.59**	1.00						
(6)	.56**	.47**	.22**	.67**	.36**	1.00					
(7)	.48**	.36**	.04**	.54**	.05**	.78**	1.00				
(8)	.36**	.42	.48**	.58**	.10	.52**	.02*	1.00			
(9)	.42**	.90	.03	.45**	.24	.62**	.16**	.00*	1.00		
(10)	.35**	.08	.37**	.37**	.47	.41**	.23**	.25**	.13*	1.00	
(11)	.47**	.32**	.28	.53**	.45	.34**	.04	.14	.49	.18	1.00

** p< 0.01, * p< 0.05

As a result of the correlation analysis shown in Table 3, correlations between curriculum literacy and critical thinking disposition are analyzed in terms of their sub-dimensions. According to the findings, a medium level relationship was observed between total curriculum literacy score and total critical thinking disposition score (r=.56, *p*<.01). Furthermore, a medium level correlation was found between total curriculum literacy and sub-dimensions of critical thinking disposition, namely metacognition (r=.48, *p*<.01), flexibility (r=.36, *p*<.01), systematicity (r=.42, *p*<.01), tenacity-patience (r=.35, *p*<.01) and open-mindedness (r=.47, *p*<.01).

Also, it was revealed that the highest correlations were observed between the total scores of curriculum literacy and its sub-dimensions of recognizing the curriculum (r=.90, *p*<.01), querying the curriculum (r=.84, *p*<.01), valuing the curriculum (r=.76, *p*<.01) and implementing the curriculum (r=.72, *p*<.01). Findings regarding how well preservice teachers' gender, taking the Curriculum Development in Education course and department predict curriculum literacy are presented in Table 4. Also, findings after controlling for gender, taking the Curriculum Development in Education course and department, how well critical thinking disposition predicts curriculum literacy are indicated in Table 4.

Table 4. *Hierarchical multiple regression analysis for variables predicting curriculum literacy*

Variable	*B*	*SE B*	*ß*	*T*	*Sr²*	R^2	ΔR^2	ΔF
Model 1:						.08*	.08*	7.71*
Constant	27.817	5.31		8.44				
female vs male	2.22	1.14	.05	2.02*	.01			
takingcurriculum course	4.68	1.56	.12	3.16*	.10			
social vs primary	-14.78	1.23	-.96	-3.97*	.33			
maths vs primary	-6.78	1.45	-.59	-3.32*	.00			
preschool vs primary	-6.56	1.12	-.47	-4.74*	.02			
Turkish vs primary	-9.23	1.68	-.76	-2.56*	.01			
guidance vs primary	-7.35	1.59	-.37	-3.96	.00			
Model 2:						.33*	.25*	35.14*
Constant	48.156	1.79		13.75				
Metacognition	.06	.02	.23	4.22*	.06			
Flexibility	.57	.10	.42	4.33*	.22			
Systematicity	.08	.03	.56	3.10*	.00			
Tenacity-patience	.17	.14	.43	.09	.03			
Open-mindedness	.26	.03	.21	2.78	.07			

Dependent variable: Total curriculum literacy

Checking the F-ratios from Table 4, it is seen that they were $F(14, 321) = 7.71$ ($p<.01$) for the Model 1 and $F(5, 330) = 35.14$ ($p< .01$) for Model 2. This finding indicated that both models were significant in predicting the dependent variable, namely total curriculum literacy. The variables, which are gender, taking curriculum development course, and department, entered in the 1st step comprising the model 1, explained 8% of the variance in curriculum literacy.

In the 2nd step, critical thinking disposition variables were entered, which comprised Model 2 and the total variance explained by both models was 33%, $F(5, 330) = 35.14$, $p <.01$. In other words, the critical thinking disposition sub-dimensions explained an additional 25% of the variance in curriculum literacy, after controlling for gender, taking the Curriculum Development in Education course and department ($\Delta R2 = .25$ and $\Delta F (5, 330) = 35.14$ ($p <.01$)). Therefore, it can be stated that the first model significantly contributed to predicting the curriculum literacy of preservice teachers. However, the second model was better than the first model in terms of predicting curriculum literacy

Also, when *t* values were checked from Table 4 to see if predictor variables contributed to the model significantly, it was found that gender $t(336)=2.02$, $p<.01$, taking curriculum development course $t(336)=3.16$, $p<.01$, social vs primary $t(336)= -3.97$, $p<.01$, maths vs primary $t(336)= -3.32$, $p<.01$, preschool vs primary $t(336)= -4.74$, $p<.01$ and Turkish vs primary $t(336)= -2.56$, $p<.01$ significantly predicted the curriculum literacy of pre-service teachers. By looking at the magnitude of the *t* statistics, it can be said that being in the Primary School Teaching department had a higher impact on the curriculum literacy of pre-service teachers than being in the Social Sciences Teaching, Elementary Mathematics Teaching, Pre-school Teaching, and Turkish Language Teaching departments. In the second model, metacognition $t(336)=4.22$, $p<.01$, flexibility $t(336)=4.33$, $p<.01$ and systematicity $t(336)=3.10$, $p<.01$ were significant predictors of curriculum literacy.

4. Conclusion and Discussion

The goal of this study was to seek the factors predicting curriculum literacy of preservice teachers in terms of some variables, such as gender, taking the Curriculum Development in

Education course, department and critical thinking disposition. As a result, it was concluded that preservice teachers had high curriculum literacy in recognizing, implementing, and valuing the curriculum sub-dimensions. Consistent with this finding, Aslan (2019), Erdem and Egmir (2018), Sarigoz and Bolat (2018) found that preservice teachers had high curriculum literacy. Contrary to these studies, Yildiz (2019) indicated that senior preservice teachers had low literacy in writing and average literacy in the reading dimensions of curriculum literacy. In addition, this study also revealed that preservice teachers had medium literacy in the 'querying the curriculum' sub-dimension. Curriculum literacy is one of the dimensions of teacher qualifications and has an important place in teacher training (Bolat, 2017). Thus, it is recommended that preservice teachers be provided with the opportunity to question and conduct in-depth analysis of the teaching curricula they will utilize in their future teaching.

According to the study's findings, preservice teachers exhibited a high level of critical thinking disposition. Future teachers must possess the disposition to think critically because they will be role models for their students. Preservice teachers, on the other hand, were found to have a low or medium degree of critical thinking disposition in previous studies (Sendag et al., 2015; Zhou et al., 2012). In addition, a medium-level relationship was discovered in the current study between curriculum literacy and preservice teachers' critical thinking disposition. This finding demonstrated that improving preservice teachers' critical thinking disposition will likely enhance their curriculum literacy.

The hierarchical multiple linear regression analysis results indicated that gender predicted the curriculum literacy of pre-service teachers. If more female students had been involved in the present study, curriculum literacy would have been higher. This result may be due to the fact that females are better at identifying problems, giving statements and questions, explaining concepts, giving reasons and opinions, and making inferences, which may be associated with curriculum literacy (Perdana et al., 2019). Therefore, it may be suggested that teacher trainers foster and train male preservice teachers to empower their curriculum literacy. Relevant literature also showed that female preservice teachers had higher curriculum literacy in the writing sub-dimension than male preservice teachers (Erdem & Egmir, 2018; Sarigoz & Bolat, 2018). However, Aslan (2019) found no significant differences in terms of gender.

According to the findings of the study, taking Curriculum Development in Education course predicted curriculum literacy of preservice teachers. This finding might be due to the fact that curriculum development course had a positive impact on preservice teachers' self-efficacy about the teaching process and teaching curricula, as also found in Sahan & Duran's (2016) study. Similarly, Aslan (2019) found that preservice teachers who took curriculum development course had significantly higher curriculum literacy. Thus, taking Curriculum Development in Education course is considered beneficial for preservice teachers.

Another finding obtained from the current study was that department predicted curriculum literacy of preservice teachers. It was concluded that being in the Primary School Teaching department had a higher impact on the curriculum literacy of pre-service teachers than other departments except Guidance and Psychological Counselling. The reason for this might be due to the fact that preservice teachers studying in the Psychological Counselling and Guidance department took a Curriculum Development in Education course (Council of Higher Education, 2007). Also, preservice teachers studying in Primary School Teaching department might have taken some elective courses regarding curriculum development or analyzed teaching curricula in other pedagogical content courses though they did not take a mandatory curriculum development course. The findings of the current study are in line with the findings of the studies conducted by Cetinkaya & Tabak (2019) and Tan-Sisman (2021) that found preservice

teachers studying Primary School Teaching Education had higher curriculum literacy and curriculum development knowledge. Contrary to these studies, Aslan (2019), Sarigoz and Bolat (2018) found no significant differences in terms of department.

Furthermore, as for the findings of the study regarding critical thinking disposition, tenacity-patience and open-mindedness sub-dimensions did not predict curriculum literacy. The reason for this may be due to the fact that preservice teachers were in their senior years and might have already developed patience and open-mindedness so far. In addition, metacognition, flexibility, and systematicity predicted curriculum literacy of preservice teachers. Metacognition is referred to as an individual's ability to have awareness, knowledge and control of their cognitive activities (Nelson, 1990) and critical thinking occurs when individuals use metacognitive skills and strategies (Magno, 2010, hence it can be said that preservice teachers who have cognition about their cognition have obtained higher curriculum literacy scores. Since curriculum literacy, similar to metacognition, requires high-level mental skills for interpretation and analysis of a curriculum, as also stated by Kahramanoglu (2019), metacognition was found to be a significant factor in predicting curriculum literacy. Furthermore, flexibility predicted curriculum literacy. Flexibility, defined as "the ability to switch between tasks and stimulus sets in a quick and flexible manner" (Diamond, 2013) is also a vital component of problem-solving (Lin et al., 2014). Thus, it can be said that preservice teachers who developed the ability to solve problems and choose among different options depending on the situation had higher curriculum literacy. In addition to metacognition and flexibility, systematicity predicted curriculum literacy. It is considered that, since systematic learning of students enhances knowledge accumulation and facilitates mastery of skills, as also expressed by Klimenko (2016 cited in Kolgatin et al., 2020), systematicity of preservice teachers' learning activities may have led them to have higher curriculum literacy.

As seen from the results, the second model involving critical thinking disposition was much better than the first model in terms of predicting curriculum literacy. Therefore, it is essential to pay more attention to improving students' critical thinking, since previous literature also confirmed the correlation between critical thinking and academic achievement (Fitriani et al., 2020; Musa, 2020; Vierra, 2014) in different courses and levels. Johnson et al. (2010) state that it is of utmost important that students develop their metacognitive skills in their application of critical thinking. Therefore, four methods as suggested by Thomas (2011) may be used for university students to improve their critical thinking: 1) Evaluating the quality of sources found on the internet, 2) analysing an argument, 3) using immediate feedback, and 4) using rubrics and reflection for self-regulation.

The findings of the present study have important implications for teacher training institutions. In the new Turkish teacher training curricula updated in 2018, the Curriculum Development in Education course is offered as a common elective course (Council of Higher Education, 2018). Therefore, depending on the importance of this course for preservice teachers in equipping them with curriculum development knowledge and curriculum literacy skills, this course may be suggested to be offered as a mandatory course for all departments of education faculty. Moreover, in the Curriculum Development in Education course, preservice teachers should not only be provided with theoretical knowledge but also be required to do analysis and evaluations regarding educational curricula to enhance their curriculum literacy as well as conduct trial curriculum development studies. In-service teachers may also be supported regarding curriculum development and curriculum literacy through professional development activities due to the fact that teachers require additional information about educational curricula before they start implementation as highlighted by Nevenglosky (2018), and they also constitute an important place in curriculum development committees and councils by

initiating proposals (Oliva & Gordon, 2013). For future research, it may be suggested to include different variables, such as reflective thinking, self-directed learning or inquiry to explore if they predict the curriculum literacy of preservice teachers.

One of the limitations of this study was that the research data were collected through self-report instruments with limited response options and whose results might not have reflected the real situation. Since critical thinking has a long tradition and is a complex construct, it is suggested that researchers conduct other tools to decrease subjectivity in further studies. Moreover, it is necessary to suggest that the curriculum literacy level of pre-service teachers be measured through research projects or assignments instead of self-report scales.

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